

Tongass National Forest

Plan Monitoring Program

Introduction

Monitoring is a quality control process for implementation of the Tongass Forest Plan. It provides the public, the Forest Service, and other concerned resource agencies with information on the progress and results of plan implementation. As such, monitoring, along with the evaluation of that monitoring, comprise an essential feedback mechanism within an adaptive management framework to keep the Plan dynamic and responsive to changing conditions. The evaluation process also provides feedback that can trigger corrective action, adjustment of plans and budgets, or both, to facilitate feasible and meaningful action on the ground.

The Plan identifies management direction for the Tongass in terms of goals, objectives, standards and guidelines—based on the underlying assumptions of statute, policy, theory, data, technology, and public needs and desires. Monitoring is gathering data and information, and observing the results of management activities as a basis for the periodic evaluation of the Plan. Evaluation is a process for interpreting monitoring data and information to determine whether changes in management direction are needed. The Tongass Plan incorporates three types of monitoring and evaluation approaches: implementation, effectiveness, and validation. Implementation monitoring and evaluation is used to determine whether standards and guidelines are implemented. Effectiveness monitoring and evaluation is used to determine whether standards and guidelines are achieving objectives, whether objectives are achieving goals, and ultimately whether there are significant changes in productivity of the land as a result. Validation monitoring and evaluation is used to examine whether the assumptions and predicted effects used to formulate the plan are accurate. Actual monitoring design and sampling methods will be described in the Tongass Forest Monitoring Guide. These methods are periodically updated to reflect the most current established survey and analysis procedures and to facilitate the Tongass staff to be responsive to improvements in monitoring and evaluation methods.

Roles and Responsibilities

Other state and federal natural resource agencies, the academic community, and interested members of the public and organizations are as interested in knowing more about the social, economic, and ecological uses and values of the National Forest System lands as the Forest Service staff. While concepts such as ecosystem services and carbon cycling and sequestration are values provided by the Tongass and influenced by its management, it is important to continue collaboration with the Pacific Northwest Research Station, the State of Alaska, other government agencies, and non-governmental groups to learn and develop these concepts.

There are opportunities to better align the interests, resources, and efforts of all these groups in monitoring and evaluation of the Forest Plan implementation. This plan monitoring program is designed to be flexible enough to respond to emerging issues and areas of high uncertainty such as climate change. Assessment of the effects of climate change has been incorporated, where possible, into many of the questions considered in Table 1.

For the purposes of this plan monitoring program, the roles and responsibilities within the Forest Service are defined below.

Regional Office. The Regional Office will develop regional policies and directives on monitoring and evaluation.

Forest. The Forest will implement the Plan and conduct implementation monitoring and evaluation. The responsibilities of the Forest include the following:

- Preparing an annual monitoring program;

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- Collecting data and information for implementation, effectiveness, and validation monitoring; and
- Analyzing and interpreting implementation monitoring data and information and reporting implementation monitoring results, conclusions and evaluation recommendations to the Regional Office, and making these reports available to the public and other agencies.

Pacific Northwest Research Station. The Pacific Northwest Research Station will provide scientific and technical expertise to conduct effectiveness and validation monitoring and evaluation relative to specific agreements. The responsibilities of the Pacific Northwest Research Station include advising and assisting the Region with the following:

- Developing monitoring study plans, including study objectives, sampling designs, methods, quality assurance plans, and budgets in cooperation with the Forest;
- Collecting data and information for effectiveness and validation monitoring (in specific cases relative to agreements with the assistance of the Forest);
- Analyzing and interpreting the data and information relative to specific studies and agreements with the Forest;
- Reporting study results, conclusions, and recommendations to the Forest, and making these reports available to the public and other agencies; and
- Publishing, when appropriate, study results in Regional publications, Pacific Northwest Research Station publications, or professional journals.

Relationship to Other Information Needs and Monitoring Activities

This plan monitoring program is not intended to describe all monitoring, inventorying, and data gathering activities undertaken on the Tongass, nor is it intended to limit monitoring. Many other similar activities are routinely conducted as part of site-specific project plans developed under the programmatic guidance of the Plan. Other routine monitoring activities include the preparation of timber sale administrator and engineering reports, special uses administration reports, and in the case of large-scale mining activities, for example, monitoring is typically included in the site-specific Plan of Operations for each mine.

Broader scale monitoring is also done through “management reviews” and “activity and program reviews” by Forest Service officials at various levels of the organization. These periodic reviews are typically done as a function of identified issues, challenges, and opportunities, or as a function of general interest in what the national forest management activities are revealing. These reviews, which are normally documented and discussed often, provide insight into information needs and different monitoring and evaluation approaches that can influence the need to adjust the Plan.

The requirements of this plan monitoring program are also not intended to replace monitoring requirements developed in the project planning process. Specific project monitoring requirements are determined during the stage of planning that addresses the National Environmental Policy Act and is based on interagency and public involvement early in the project planning process. Although there is some overlap between monitoring requirements of most project plans and the Forest Plan, no single project monitoring plan is expected to address all of the questions listed in this plan monitoring program. Some project plans may impose monitoring requirements not included at the Forest Plan level in response to site-specific concerns. Taken as a whole, however, Forest project monitoring should be designed, to the extent possible, to provide information that is compatible with the questions at the broader level. In other words, where the Forest Service can supplement the Forest Plan monitoring and evaluation objectives with project-level monitoring information that enhances the knowledge base with consistent and compatible information, the Forest Service will do so.

The opportunity to promote the alignment and coordination of management and investment in information needs with the State of Alaska and other federal agencies is high. Alignment for the Forest Service can include promoting consistent collection and reporting of project implementation monitoring so that such information can be used or sampled at the Forest-wide scale. Such alignment could also provide more consistent data and information for researchers to use in effectiveness and validation monitoring of the Forest Plan.

Similarly, other entities could use consistent Forest Service data to help address their own information needs as well as facilitate the ability to share information and data between entities.

Monitoring and Evaluation Programs

In the past the Forest Supervisor as responsible for coordinating the preparation of an annual monitoring and evaluation report. The 2012 Planning Rule now requires a biennial evaluation of information gathered through this plan monitoring program and the relevant information from the broader scale strategy. The report will summarize the monitoring activities conducted during the prior two years and the results obtained. It will address and evaluate each of the questions listed in this plan monitoring program at the reporting period identified. Generally the evaluation report will focus on the information gathered during the two years and identification of issues requiring immediate attention, while the more comprehensive evaluation process will take place during the fifth year.

The monitoring evaluation report must indicate whether or not a change to the plan, management activities, or the monitoring program, or a new assessment, may be warranted based on the new information. The monitoring evaluation report must be used to inform adaptive management of the plan area. Specific recommendations for corrective action will depend on the risk to the resource and type of disparity discovered. The types of action that could be recommended include the following:

- No action, if monitoring and evaluation indicate that the standards and guidelines are being followed and the results are meeting Forest Plan objectives.
- Additional monitoring, if initial results are inconclusive or indicate a pattern of minor discrepancies between the standards and guidelines and their implementation, or between expected and actual results.
- Referral to the appropriate line officer for action to ensure proper application of the standards and guidelines, if compliance is inconsistent.
- Changing a projected output, if it appears to be unachievable given funding and other constraints.
- Revising the budget, if the anticipated cost of Forest Plan implementation appears to be incorrect.
- Amending the Forest Plan to change, for example, the allocation of particular areas from one Land Use Designation to another, or changing one or more of the standards and guidelines.
- Revising the Forest Plan, if major changes are warranted.

As a result of the 2012 Planning Rule, there is also the opportunity to make modifications to the plan monitoring program utilizing administrated changes as described in 36 CFR 219.13(c)(1).

User Notes

Monitoring and evaluation provides for a periodic determination and evaluation of the effects of management practices. The implementation of the Plan evaluated through monitoring can be used to evaluate how well the objectives of the Plan are met and how closely the management standards and guidelines have been applied. Monitoring provides feedback for adaptive management planning.

Adaptive management is a term that generally describes a dynamic management approach where management guidelines can be modified in response to evaluated conditions, based upon established criteria. Basically, this approach promotes the idea of making changes to our management actions as a result of what we learn from actual activities and doing so efficiently. The Tongass plan monitoring program facilitates adaptive management through the components of the plan monitoring program illustrated in Table 1. These components include data collection reflected through the monitoring questions, the sampling and reporting period of the question evaluation, the evaluation criteria that references the applicable standard and guideline or policy that provides the baseline for monitoring, the relative work projects that contribute data and information, and the response reflected through feedback mechanisms.

Following is a description of how the monitoring and evaluation items in this Plan are organized in Table 1. Data collected for each monitoring item will be aggregated and evaluated on an annual basis unless otherwise noted. Monitoring items include the following five components:

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1. **Monitoring Question**—Questions that can be answered to evaluate if the standards and guidelines are applied, if the standards and guidelines are effective, and if the resource objectives of the Forest Plan are met. Questions are organized under Physical and Biological Environment, Human Uses and Land Management, and Economic and Social Environment by Resource Group. Listed above the question is a brief description of goals and objectives applicable to the resource.
2. **Sampling/Reporting Period**—Sampling period is the frequency of data and information collection. Reporting period is the frequency of data evaluation and reporting. Data are generally collected annually and reported and evaluated at 5-year intervals. The reason for this is that annual variations may not be significant because of budget or other temporary factors. True trends are better evaluated over a longer period of time, such as 5 years. If the results of the annual data collection indicate a serious concern, the frequency of reporting and evaluation can be adjusted and immediate remedial action may be taken.
3. **Indicators**—Management objectives, standards, guidelines, or other bases for monitoring. Where appropriate, the alpha-numeric code for standards and guidelines are listed (refer to Forest-wide Standards and Guidelines). In some cases, Indicators are specific to a single monitoring question and in other cases, they are applicable to multiple questions.
4. **Data and Information Sources**—Ongoing work projects that are associated with collection of information, data, and evaluation specific to monitoring questions. In some cases, data and information sources are specific to a single monitoring question and in other cases, they are applicable to multiple questions.
5. **Feed Back Mechanisms**—Forest management practices and Standard and Guidelines that should be evaluated to identify if the practices and guidelines provide the resource protection and outcomes identified in the objectives, goals, and management prescriptions. In some cases, feed back mechanisms are specific to a single monitoring question and in other cases, they are applicable to multiple questions.

The Forest will develop an annual monitoring action plan that utilizes the direction found here, the protocols described in the Monitoring Guidebook, and information on annual budgets. Items specifically included in the action plan include the following:

- **Sampling Methods**—General methods for collecting information needed to address the monitoring question. More detailed sampling methodologies are contained in the Monitoring Guidebook. These methods will be periodically updated. Descriptions of the expected precision and reliability of the monitoring process will be addressed in the Monitoring Guidebook. For the purposes of this plan monitoring program, precision refers to the closeness of repeated measurements, while reliability refers to the nearness of a measurement to the actual variable being measured.
- **Indicators**—Management objectives, standards, guidelines, or other bases for monitoring. Where appropriate, the alpha-numeric code for standards and guidelines are listed (refer to Forest-wide Standards and Guidelines, Chapter 4).
- **References**—Statutory or regulatory foundations of the monitoring question.
- **Annual Cost**—Estimated cost of collecting and analyzing information and reporting results to address each question. Although actual annual funding may not correspond to the level projected in the Plan, the Forest will, subject to appropriations and higher level funding direction, ensure monitoring and evaluation is funded at a level commensurate with the level of funding provided for program implementation. The total annual estimated costs for field monitoring and evaluation is approximately \$550,000.

2015 Revision of Forest Monitoring Program

The Requirements of the 2012 Planning Rule

The 2012 Planning Rule requires that an existing plan's monitoring program must be made to conform to the monitoring requirements of the Rule within 4 years of the Rule's May 9, 2012 effective date (May 9, 2016), or as soon as practicable:

Where a plan's monitoring program has been developed under the provisions of a prior planning regulation and the unit has not initiated plan revision under this part, the responsible official shall modify the plan monitoring program within 4 years of the effective date of this part, or as soon as practicable, to meet the requirements of this section. (36 CFR 219.12 (c)(1)).

The 2012 Planning Rule, in 36 CFR 219.12 (a)(5), included the following eight requirements:

Each plan monitoring program must contain one or more monitoring questions and associated indicators addressing each of the following:

- (i) The status of select watershed conditions.*
- (ii) The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems.*
- (iii) The status of focal species to assess the ecological conditions required under § 219.9.*
- (iv) The status of a select set of the ecological conditions required under § 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.*
- (v) The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.*
- (vi) Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area.*
- (vii) Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities.*
- (viii) The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 U.S.C. 1604(g)(3)(C)).*

How the Tongass National Forest Meets the Requirements of the Rule

The Tongass National Forest has a robust plan monitoring program that already addresses many of the eight requirements listed in the 2012 Planning Rule. The Tongass National Forest analyzed each of the eight monitoring requirements of the 2012 Planning Rule, and identified how the Forest currently meets that requirement. This is summarized below.

In the case, where modifications to the existing plan monitoring program are necessary in order to meet the requirement, that modification is explained.

(i) The status of select watershed conditions.

The existing plan monitoring question # 21 Soil and Water – Watershed Health, currently meets this requirement.

(ii) The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems.

Three existing plan monitoring questions, # 4 Biodiversity - Habitat for Old-Growth Associated Species, # 10 Biodiversity Ecosystem - Change in Old-Growth by Biogeographic Province, and # 11 Biodiversity Ecosystem – Old-Growth Matrix currently meet this requirement for terrestrial ecosystems. In addition, the existing plan monitoring question # 14 Streams-Fish Habitat - Aquatic Habitat Condition currently meets this requirement for aquatic ecosystems.

(iii) The status of focal species to assess the ecological conditions required under § 219.9.

The Tongass NF is currently engaged in a Forest Plan amendment that will address Management

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Indicator Species and focal species. It is expected that focal species will be formally identified in the Record of Decision for that amendment. It is also expected that within one year of the selection of focal species for the Tongass NF, or as soon as practicable, the responsible official shall modify the plan monitoring program to meet the requirements of this section.

(iv) The status of a select set of the ecological conditions required under § 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.

The existing plan monitoring question # 17 Wildlife Terrestrial Habitat - Federally Listed Threatened or Endangered & Region Sensitive Species currently meet this requirement, especially if the inclusion of both plants and animals is more clearly described.

In the 2015 Revision the existing question is modified to specifically include both plants and animals and by adding Species of Conservation Concern in anticipation of those species being identified by the Regional Forester. It has also been moved and renumbered as question # 18.

(v) The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.

The existing plan monitoring question # 37 Recreation, currently meet the requirement regarding progress toward meeting recreation objectives. Information regarding visitor use and satisfaction is already being gathered as a component of the National Visitor Use Monitoring program. The existing plan monitoring question is modified to include visitor use and satisfaction.

(vi) Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area.

To better meet this requirement, monitoring question # 2 Climate Change is modified to utilize the tree species composition analysis that is performed and provided by PNW. In the future, it is expected that the forest will further modify the monitoring question and supplement the tree species composition analysis with additional monitoring protocols.

(vii) Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities.

The existing plan monitoring program was designed, in part, to meet this requirement even though the 2008 Forest Plan was developed with less focus on Forest-wide Desired Conditions and a greater focus on Forest-wide Multiple-use Goals. Within this limitation most Plan monitoring program Questions were designed to meet specific Forest Plan Objectives.

For the purpose of meeting this requirement of the 2012 Planning Rule, two existing plan monitoring questions # 19 Soil and Water – Soil Productivity and # 20 Soil and Water – State Water Quality Standards clearly meet this requirement of the 2012 Planning Rule.

(viii) The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 U.S.C. 1604(g)(3)(C)).

The existing plan monitoring questions # 19 Soil and Water - Soil Productivity meets this requirement for maintaining the productivity of the land.

The March 2015 Modifications

The plan monitoring program for the Tongass National Forest that was developed in 2008 already addressed many of the requirements of the 2012 Planning Rule. The March 2015 modifications of the plan monitoring program were adopted to address the gaps between the existing program and the requirements of the 2012 Planning Rule. The March 2015 modifications include the following:

- The Monitoring Question that addressed Federally Listed Threatened or Endangered and Alaska Region Sensitive Species has been slightly modified so as to clearly indicate that it includes both plants and animals. In addition, it has been modified to include Species of Conservation Concern as required by the 2012 Planning Rule. Although, Species of Conservation Concern for the Tongass National Forest have not yet been identified by the Alaska Region, the Monitoring Question has been modified to include those species once they have been identified. It has also

been moved and renumbered as question # 18.

- The Monitoring Question that addressed Recreation (# 37) currently meets the requirement regarding progress toward meeting recreation objectives. Furthermore, information regarding visitor use and satisfaction is already being gathered as a component of the National Visitor Use Monitoring (NVUM) program. As a result, the existing plan monitoring question for Recreation has been modified to include a second part that specifically addresses visitor use and satisfaction as currently measured by the NVUM program.
- The Monitoring Question that addressed Climate Change (# 2) has been modified to more clearly address the requirement of the 2012 Planning Rule for monitoring measurable changes related to climate change and other stressors that may be affecting the Forest. It is anticipated that ongoing climate change vulnerability assessments and multi-stakeholder collaborations will result in a suite of monitoring questions related to climate change. Until that work is completed, the monitoring question has been modified to focus on tree species composition and related factors by utilizing estimates based on data that is currently being gathered by the Pacific Northwest Research Station through the Forest Inventory and Analysis (FIA) program.

Deferred and Future Actions

In addition to the actions discussed in the previous section related to Species of Conservation Concern not yet identified by the Alaska Region, and the current climate change vulnerability assessments potentially identifying a suite of monitoring questions related to climate change; one requirement of the 2012 Planning Rule is being deferred at this time. The requirement that the Forest monitor the status of focal species to assess the ecological conditions required under 36 CFR 219.9 will be deferred until focal species are identified as a part of the Forest Plan Amendment currently under way. It is anticipated that the monitoring questions addressing Management Indicator Species will be modified to address focal species, shortly after the plan amendment is completed in 2016.

In addition, the Forest Plan Amendment, currently under way, may identify other modifications to the plan monitoring program that should be made. Those modifications will be documented as a part of that process.

Reference to Requirements of the 2012 Planning Rule

For each question in Table 1, a reference to the specific requirement of the rule is given. For those ten questions that specifically address a requirement of the rule and are described in the section, *How the Tongass National Forest Meets the Requirements of the Rule*, above, the reference is appended with the word "Requirement." This includes questions 2, 4, 10, 11, 14, 18, 19, 20, 21, and 37. For those questions that are intended to monitor specific Forest Plan components, the reference is appended with the phrase "Forest Plan."

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Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
Physical and Biological Environment				
Air Quality The current air resource condition should be maintained to protect the Forest's ecosystems from on and off Forest air emissions sources. 1. Is air quality being maintained? (36 CFR 219.12 (c)(1)vii) – <i>Forest Plan</i>	Annual/5 year	Changes in air quality relative to state and federal ambient air quality standards. AIR2 II.A.	Air inventory and monitoring	Evaluate and change management practices; Air Standards and Guidelines
Climate Change and Other Stressors 2. What are the measurable changes related to climate change and other stressors that may be affecting the Forest? (36 CFR 219.12 (c)(1)vi) - <i>Requirement</i>	5 year/5 year	Changes In tree species composition as measured by basal area cover, and other changes including growth, sapling recruitment, harvest, snags, decay, and other relevant measures. TIM2	Inventory data from FIA permanent plots established in 1995–2003 and remeasured periodically are used to provide estimates of tree species composition and other factors.	Evaluate key changes and effects on selected resources and assess potential changes to the Forest Plan

Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Biodiversity</p> <p>Manage young-growth to improve habitat for wildlife and for commercial timber production.</p> <p>3. Are harvested forest lands restocked within 5 years after harvest? (36 CFR 219.12 (c)(1)vii) – Forest Plan</p> <p>4. Following young-growth treatments, is the change in understory vegetation providing improved habitat for key old-growth associated species? (36 CFR 219.12 (c)(1)iii) – Requirement</p> <p>5. Are young-growth treatments improving other key habitat components for old-growth associated species? (36 CFR 219.12 (c)(1)vii) – Forest Plan</p>	<p>Annual/5 year</p> <p>Annual/5 year</p> <p>Annual/5 year</p>	<p>Restocking of all acres of harvested forest land following a regeneration harvest. (TIM9)</p> <p>Assessment of understory species composition: (WILD2)</p> <p>Assessment of understory species composition: (WILD2) and restocking of yellow cedar (TIM9)</p>	<p>Silviculture inventory (FACTS), wildlife inventory, Tongass-wide young-growth study (TWYGS)</p>	<p>Evaluate and change, if needed, silvicultural prescriptions; KV Plans; Timber Standards and Guidelines and; Wildlife Standards and Guidelines</p>
<p>Insects and Disease</p> <p>The Forest's management activities do no contribute to increasing levels of destructive insect and disease organisms.</p> <p>6. Are destructive insects and disease organisms increasing to potentially damaging levels following management activities? (36 CFR 219.12 (c)(1)vii) – Forest Plan</p>	<p>Annual/5 year</p>	<p>Identify and quantify areas where insects and disease are occurring: HEALTH1.</p>	<p>Silviculture inventory, state and private forestry insect and disease surveys; Pacific Northwest Research Station alternatives to clear cut study</p>	<p>Evaluate and change, if needed, management practices; Timber Standards and Guidelines; Invasive Species Standards and Guidelines</p>

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Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Invasive Species</p> <p>The Forest has reduced the potential for introduction, establishment, and spread of invasive species and has reduced existing infestations.</p> <p>7. What are the status and trends of areas infested by aquatic and terrestrial invasive species relative to the desired condition? (36 CFR 219.12 (c)(1)vii) – Forest Plan</p> <p>8. How effective were our management activities, including those done through partnerships, in preventing or controlling targeted invasive species? (36 CFR 219.12 (c)(1)vii) – Forest Plan</p>	<p>Annual/5 year</p> <p>Annual/5 year</p>	<p>An assessment of changes noted in inventory of aquatic and terrestrial invasive species: INV1.</p>	<p>Silviculture inventory, state and private forestry insect and disease surveys; Pacific Northwest alternatives to clear cut study</p>	<p>Evaluate management practices and change, if needed; Timber Standards and Guidelines; Invasive Species Standards and Guidelines</p>

Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Biodiversity Ecosystem</p> <p>Forest biodiversity will be monitored with two coarse-filter approaches. The first assesses the spatial distribution and composition of old-growth reserves and the cumulative harvest of old-growth timber by biogeographic province. The second examines emerging information concerning conservation of plant and animal species on the Forest. We will also monitor biodiversity at the finer scale and look at selected species as well as implementation of standards and guidelines (i.e., Legacy Standards and Guidelines).</p> <p>9. Is the old-growth habitat protected under the Forest Plan being maintained to support viable and well distributed populations of old-growth associated species and subspecies? (36 CFR 219.12 (c)(1)vii) – Forest Plan</p> <p>10. Are the effects of biodiversity shown through the cumulative change in old-growth by biogeographic province consistent with the estimates of the Forest Plan (change could includes effects of timber harvest, land exchanges or conveyance, windthrow, insect and disease, climatic change, etc)? (36 CFR 219.12 (c)(1)ii) – Requirement</p> <p>11. Is old growth structure retained in the matrix adequate and is it representative of old growth types across VCUs and across the Forest? (36 CFR 219.12 (c)(1)ii) – Requirement</p> <p>12. What are the cumulative effects of changes to habitats that sustain rare plants? (36 CFR 219.12 (c)(1)vii) – Forest Plan</p>	<p>Annual/5 year</p> <p>Annual/5 year</p> <p>Annual/5 year</p> <p>Annual/5 year</p>	<p>Changes in the system of large, medium and small habitat reserves and non-development LUDs WILD1 II.B.</p> <p>Changes in the amount of old growth in relations to finer scale classification (i.e., plant associations) at appropriate scales: WILD1 II.B.</p> <p>Amount and effectiveness of retained old-growth structure, including legacy and other retained patches, within managed landscapes</p> <p>Habitat changes for threatened, endangered, and sensitive taxa: WILD4, FISH5, and PLA1.</p>	<p>Sliviculture inventory; wildlife inventory, Forest GIS layers</p>	<p>Evaluate management practices and change, if needed; Timber Standards and Guidelines; Wildlife Standards and Guidelines</p>

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Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Streams-Fish Habitat</p> <p>The natural range and frequency of aquatic habitat conditions on the Tongass National Forest should be maintained or restored to sustain the diversity and production of fish and other freshwater organisms.</p> <p>13. Are the trends in abundance of the fish management indicator species (Dolly Varden char, cutthroat trout, coho salmon, and pink salmon) related to changes in habitat associated with forest management, climate change or other factors? (36 CFR 219.12 (c)(1)vii) – Forest Plan</p> <p>14. Is the natural range and frequency of aquatic habitat conditions maintained? (36 CFR 219.12 (c)(1)ii - Requirement</p> <p>15. Is riparian vegetation maintained or restored to a condition that supports key riparian functions? (36 CFR 219.12 (c)(1)vii) – Forest Plan</p>	<p>Annual/5 year</p> <p>Annual/5 year</p> <p>Annual/5 year</p>	<p>Habitat changes and population trends for fish management indicator species.</p> <p>Compliance with Fish Standards and Guidelines, FISH2 IV.A. and V.A</p> <p>Effects of management activities on riparian areas. Riparian Standards and Guidelines, RIP1 II.A</p>	<p>Field collected data; Forest-wide databases</p>	<p>Evaluate site characteristics; stream protection measures and change, if needed,; Fish and Riparian Standards and Guidelines</p>

Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Wildlife Terrestrial Habitat</p> <p>The abundance and distribution of habitats, especially old-growth forests, to sustain viable populations of wildlife should be maintained. Also, maintain habitat capability sufficient to produce wildlife populations that support the use of wildlife resources for subsistence, recreation, and commercial activities.</p>				
<p>16. Are population and habitat trends for Management Indicator Species (MIS) consistent with expectations? Are these trends due to changes in habitat conditions or other factors? If they are tied to habitat conditions, is there a direct relationship with forest management, climate change or other factors? Terrestrial MIS include Red Squirrel, Black Bear, Brown Bear, Marten, River Otter, Sitka Black-tailed Deer, Mountain Goat, Gray Wolf, Vancouver Canada Goose, Bald Eagle, Red-breasted Sapsucker, Hairy Woodpecker and Brown Creeper? (36 CFR 219.12 (c)(1)vii) – Forest Plan</p>	Annual/5 year	Habitat changes and population trends for management indicator species: WILD1. II.E. (drop green)	Wildlife inventory and monitoring; population trend data from various sources (ADFG, Breeding Bird Survey, Alaska Landbird Monitoring,)	Evaluate management practices and change if needed; Wildlife Standards and Guidelines
<p>17. (Formerly # 18.) What is the geographic distribution and habitat relationships of mammalian endemic species the Tongass? (36 CFR 219.12 (c)(1)vii) – Forest Plan</p>	Annual/5 year	Documentation for mammalian taxa with limited historical ranges including geographic extent and habitat distribution across islands and mainland Forest: WILD1.I.B.		

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Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Threatened and Endangered Species and Species of Conservation Concern</p> <p>Viable populations of native species and their habitat are maintained. Viable populations of sensitive and rare species and their habitats are considered and maintained as to preclude the need for listing species as threatened or endangered. There are no threatened or endangered species on the Forest.</p> <p>Provide sufficient habitat to preclude the need for listing species under the Endangered Species Act, or from becoming listed as Sensitive due to National Forest habitat conditions.</p> <p>18. (Formerly # 17) Is current management providing for sufficient habitat of federally listed threatened or endangered species, Alaska Region sensitive species, and species of conservation concern? 36 CFR 219.12 (c)(1)iv – Requirement</p>	Annual/5 year	Changes in habitats for the listed threatened or endangered species, Alaska Region sensitive species, and species of conservation concern: PLA1, WILD4	Wildlife inventory and monitoring; population trend data from various sources (ADFG, Breeding Bird Survey, Alaska Landbird Monitoring); TNF Rare Plant Monitoring.	Evaluate management practices and change if needed

Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Soil and Water</p> <p>Soil productivity is maintained to Alaska Region (R-10) Soil Quality Standards. Soil erosion from land disturbing activities is minimized. Sediment transport to streams from land disturbing activities should be minimized. The biological, physical, and chemical integrity of Tongass National Forest waters should be maintained to the State of Alaska Water Quality Standards. Ecological function is maintained within watersheds of the plan area while resource management activities sustain human needs and uses.</p>				
<p>19. Are the soil conservation practices implemented and effective in meeting Alaska Regional Soil Quality Standards and maintaining soil productivity? 36 CFR 219.12 (c)(1)vii and viii) – Requirement</p>	Annual/5 years	Compliance and implementation of the Region 10 Soil Quality Standards SW3 I.A.4	Field-collected data; Forest wide data bases; BMP Soil and Water Monitoring	Evaluate site characteristics and change if needed; logging systems implementation; road design and construction; recreation design and development; Soil and Water Standards and Guidelines
<p>20. Are the soil and water conservation practices as described through the Best Management Practices and site specific prescriptions implemented and effective in minimizing soil erosion and maintaining the State Water Quality Standards? 36 CFR 219.12 (c)(1)vii) – Requirement-</p>	Annual/B-Annual	Compliance and implementation of BMPs and the State Water Quality Standards SW3 I.A.2 and 3.		
<p>21. What is the ecological condition and trend of watersheds in terms of key characteristics (such as soil productivity, water quality and quantity, invasive species, etc.) of watershed health identified in the desired condition (aquatic ecosystem potential) of the plan area? How effective are management actions in improving watershed health (maintaining or moving watersheds toward Condition Class I)? 36 CFR 219.12 (c)(1)i) – Requirement</p>	Bi-annual/5 years	Effects of management activities on Watershed Condition Class SW4 I.A.1		Evaluate site characteristics and restoration practices

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Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Wetlands</p> <p>The destruction, loss or degradation of wetlands should be avoided to the extent practicable. Where wetlands cannot be avoided, impacts to wetlands should be minimized to the extent practicable.</p> <p>22. Were the wetland conservation practices implemented and effective to avoid and/or minimize impacts to wetlands to the extent practicable? 36 CFR 219.12 (c)(1)(vii) – Forest Plan</p>	As needed/ 5 year	Compliance and implementation of the Wetlands Standards and Guidelines: WET I.A and B	Field-collected data, forest wide database; BMP Soil and Water Monitoring	Evaluate site characteristics and change if needed; logging systems implementation; road design and construction; recreation design and development; Soil and Water Standards and Guidelines
<p>Karst and Cave Ecosystems</p> <p>The significant cave and karst ecosystems should be maintained and protected Forest-wide. Natural karst processes should continue and the productivity of the karst landscape should be maintained.</p> <p>23. Are the biological, mineralogical, cultural, paleontological components, and recreational values of the karst and caves maintained? 36 CFR 219.12 (c)(1)(vii) – Forest Plan</p>	Annual/5 year	Effects of management activities on caves and karst landscape: KC1.II. A, C, and F; KC2 I.A.	Karst inventory and monitoring	Evaluate management practices and change if needed; Karst and Cave Standards and Guidelines

Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanis
Human Uses and Land Management				
Timber Resources Manage the timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest, on an even-flow, long-term sustained yield basis and in an economically efficient manner.				
24. Is the timber management program meeting the objectives of achieving economic timber sales and rebuilding the volume under contract and shelf volume components of the sale program? 36 CFR 219.12 (c)(1)vii) – Forest Plan	Annual/5 year	Chapter 2 Timber Goals and Objectives.		
25. Are timber harvest activities adhering to applicable timber management standards and guidelines relative to: created openings exceeding the maximum size limit for unit harvest, harvest on slopes greater than 72 percent slope gradient, or within the 1,000 feet beach and estuary buffer? 36 CFR 219.12 (c)(1)vii) – Forest Plan	First 1 to 3 years, semi-annual greater than 3 years, as needed	Harvest units in compliance with Forest-wide Standards and Guidelines: TIM5 II.C, III.A,B and C. (unit size limits); SW3 I.A.5. (72 percent slopes); BEACH2 II.A.6 (beach and estuary fringe).	Silviculture Inventory, Timber Monitoring	
26. Is the ASQ landbase consistent with resource information and programmed harvest? 36 CFR 219.12 (c)(1)vii) – Forest Plan	Annual/5 year	New information leading to changes in timber utilization standards, timber inventory results, timber dispersion requirements, tentatively suitable land base, yield tables, operability inventory, projections on area managed for riparian, beach fringe, and estuary resources, implementation factors, spatial limitations of analysis, natural condition. TIM4.	Cut and sold monthly report and 6/12-month sale reports Silviculture inventory, timber monitoring, GIS layers of soils and streams	Evaluate management practices and change if needed;; Timber Standards and Guidelines
27. Is the timber demand being met within limits of the adaptive management strategy and TTRA? 36 CFR 219.12 (c)(1)vii) – Forest Plan	Annual/5 year	Annual Demand Calculation.		
28. Has a Timber Sale Adaptive Management Strategy threshold been reached, so that it is appropriate to move to the next phase? 36 CFR 219.12 (c)(1)vii) – Forest Plan	Annual/5 year	Annual scheduled volume harvested.		

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Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Timber Management</p> <p><u>Non-interchangeable Components (NIC).</u> The annual allowable sale quantity was partitioned into two components based on operability to promote economic sustainability of the timber resource. This approach distinguishes portions of the timber supply at lower risk of attainment from those portions at higher risk of attainment. Volumes associated with each component will be identified separately in annual harvest plans for the Forest and are not to be substituted for volume from the other component to determine the allowable sale quantity. Land of normal operability is designated NIC I; all other land is designated NIC II.</p> <p>29. Are the non-interchangeable components (NICs) of the allowable sale quantity consistent with actual harvest? 36 CFR 219.12 (c)(1)vii) – Forest Plan</p> <p>30. Is the proportional mix of volume in NIC I and NIC II as estimated in the Forest Plan accurate? 36 CFR 219.12 (c)(1)vii) – Forest Plan</p>	<p>Annual/5 year</p> <p>Annual/5 year</p>	<p>Amount of harvest by NIC is consistent with amounts specified in Forest Plan.</p> <p>Estimate the amount of volume within NIC I and NIC II areas across the Forest.</p>	<p>Silviculture inventory, timber monitoring</p>	<p>Evaluate management practices and change if needed; Timber Standards and Guidelines</p>

Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Transportation System</p> <p>Roads, trails and utility systems are developed and managed to support resource management; recognize the potential for future development of major transportation and utility system.</p> <p>Each log transfer facility (LTF) is operated under terms of the LTF permits, in accordance with Alaska Water Quality Standards, and requirements from the Environmental Protection Agency for Storm Water Discharge (EPA NPDES permits).</p> <p>31. Are the standards and guidelines used for forest development roads and log transfer facilities effective in limiting the environmental effects to anticipated levels? <i>36 CFR 219.12 (c)(1)vii) – Forest Plan</i></p> <p>32. Are roads and trails maintained in accordance with management objectives? <i>36 CFR 219.12 (c)(1)vii) – Forest Plan</i></p>	<p>Annual/5 year</p> <p>Annual/5 year</p>	<p>Environmental effects of forest development roads and Log transfer Facilities. Focal areas include: drainage of rock pits (TRAN4 IV., BMP 14.9, TRAN4 II.A.6; BMP 14.17), and effectiveness of access management prescriptions in restricting access and preventing sediment transport: TRAN6 1.A.</p>	<p>Roads and LTF inventory and monitoring</p>	<p>Evaluate management practices and change if needed; Transportation Standards and Guidelines</p>

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Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Mining and Minerals Exploration</p> <p>Provide for environmentally sound mineral exploration, development, and reclamation in areas open to mineral entry and in areas with valid existing rights that are otherwise closed to mineral entry. Seek withdrawal of specific locations where mineral development may not meet Land Use Designation objectives. Encourage the prospecting, exploration, development, mining, and processing of locatable minerals in areas with the highest potential for minerals development. Insure that minerals are developed in an environmentally sensitive manner, and other high-valued resources are considered when minerals developments occur.</p> <p>33. Are Federal regulations (36 CFR 228) to ensure surface resource protection implemented and is the administration of this regulation through the Forest Plan effective in limiting soil and water resource impacts? 36 CFR 219.12 (c)(1)vii) – Forest Plan</p>	Annual/5 year	Changes in effects relative to anticipated effects on soil and water resources relative to observations: MG2 III. B.	Minerals inventory and monitoring	Evaluate management practices and change if needed; Minerals and Geology Standards and Guidelines
<p>Subsistence Management</p> <p>Provide for the continuation of subsistence uses and resources by all rural Alaskan residents.</p> <p>34. Are the effects of management activities on subsistence users in rural Southeast Alaska communities consistent with those estimated in the Forest Plan? 36 CFR 219.12 (c)(1)vii) – Forest Plan</p>	Annual/5 year	Changes in traditional resource use patterns, traditional environmental knowledge, and subsistence needs and uses; Trends in changes both State and Federal harvest regulations SUB I.D.	Subsistence records, ADFG and Federal hunt reports and regulations	Evaluate management practices and change if needed; Subsistence Standards and Guidelines

Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Wilderness</p> <p>Extensive, unmodified natural environments characterize all designated Wilderness on the Tongass National Forest. Ecological processes and natural conditions are not measurably affected by past or current human uses or activities. Users have the opportunity to experience independence, closeness to nature, solitude and remoteness, and may pursue activities requiring self-reliance, challenge and risk. Motorized and mechanized use is limited to the minimum needed for the administration of the wilderness, access to state and private lands, subsistence uses, and for public access and other uses specifically allowed by ANILCA.</p> <p>35. Is the wilderness character being maintained? 36 CFR 219.12 (c)(1)(vii) – Forest Plan</p>	Annual/5 year	Compliance with guidelines establishing levels of social encounters, development, and visitor impacts: REC3.	Wilderness inventory and monitoring	Evaluate management practices and change if needed; Wilderness Standards and Guidelines
<p>Heritage Resources</p> <p>Identify, evaluate, preserve, protect, and enhance heritage resources through application of Forest guidance and on a project-specific basis pursuant to the National Historic Preservation Act (NHPA), as amended, as well as other relevant acts and implementing regulations (for example, the Archaeological Resources Protection Act and the Native American Graves Protection and Repatriation Act).</p> <p>36. Are (1) project clearance/inventory, (2) project implementation, (3) mitigation, and (4) enhancement completed in accordance with the requirements and regulations for heritage resources? 36 CFR 219.12 (c)(1)(vii) – Forest Plan</p>	Annual/5 year	Compliance of activities with Heritage Resource Standards and Guidelines: HSS I, II, III, VI.	Heritage inventory and monitoring	Evaluate management practices and change if needed; Heritage and Sacred Sites Standards and Guidelines

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Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Recreation</p> <p>Provide a range of recreational opportunities consistent with public demand, emphasizing locally popular recreation places and those important to the tourism industry.</p> <p>37a. Are areas of the Forest being managed in accordance with the prescribed Recreation Opportunity Spectrum (ROS) class in Forest-wide Standards and Guidelines? Is the ROS classification consistent with public demand? 36 CFR 219.12 (c)(1)vii) – Requirement</p> <p>37b. What is the status and trend of visitor use and visitor satisfaction? 36 CFR 219.12 (c)(1)v) – Requirement</p>	<p>Annual/5 year</p> <p>5 year/5 year</p>	<p>Compliance with guidelines: REC3 I, II,III, Appendix I (and other standards and guidelines specific to numbers of encounters allowed in each ROS class).</p> <p>Annual Visitation Estimates and Percent Satisfied.</p>	<p>Recreation inventory and monitoring</p> <p>National Visitor Use Monitoring (NVUM) Program</p>	<p>Evaluate management practices and change if needed; Recreation and Tourism Standards and Guidelines</p>
<p>Wild and Scenic Rivers</p> <p>Wild Rivers and river segments are in a natural, free-flowing, and undisturbed condition.</p> <p>Scenic and Recreational Rivers and river segments are in a generally unmodified, free-flowing condition</p> <p>38. Are Wild, Scenic, and Recreational River Standards effective in maintaining or enhancing the free flowing conditions and outstandingly remarkable values at the classification level for which the river was found suitable for designation as part of the National Wild and Scenic River System? 36 CFR 219.12 (c)(1)vii) – Forest Plan</p>	<p>Annual/5 year</p>	<p>Compliance of activities with standards and guidelines. The degree to which human activities maintain or enhance the resource values of the river: REC3.</p>	<p>Recreation inventory and monitoring</p>	<p>Evaluate management practices and change if needed; Recreation and Tourism Standards and Guidelines</p>

Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
<p>Scenery</p> <p>Provide Forest visitors with visually appealing scenery with emphasis on areas seen along the Alaska Marine highway, State highways, major forest roads, and from popular recreation places; recognize that in other areas where landscapes are altered by management activities, the activity may visually dominate the characteristic landscape.</p> <p>39. Are the adopted scenic integrity objectives established in the Plan met? 36 CFR 219.12 (c)(1)(vii) – Forest Plan</p>	Annual/5 year	Whether the standards and guidelines associated with unit harvest and view shed disturbed are adequate to meet the scenic integrity objectives: SCENE2 II.A, B, C, D	Scenery inventory and monitoring	Evaluate management practices and change if needed; Scenery Standards and Guidelines

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Table 1. Forest Plan Monitoring Questions, Evaluation Criteria and Adaptive Management Feedback Mechanism (continued)

Forest Plan Objectives and Monitoring Questions	Sampling/ Reporting Period	Indicators	Data Sources	Feed Back Mechanism
Economic and Social Environment				
<p>Economics</p> <p>Provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska. Work with local communities to identify rural community assistance opportunities and provide technical assistance in their implementation. Support a wide range of natural-resource employment opportunities within Southeast Alaska's communities.</p> <p>40. Are the effects on employment and income similar to those estimated in the Forest Plan? 36 CFR 219.12 (c)(1)(vii) – Forest Plan</p>	Annual/5 year	Effects of Forest Plan implementation of employment and income by resource sector.	Socio-Economic inventory	Evaluate management practices and change if needed; Rural Community Assistance Standards and Guidelines
<p>Cost and Outputs</p> <p>The Forest is allocated funds annually to be used to accomplish Forest Plan Objectives.</p> <p>41. What is the trend in outputs and costs associated with those outputs? 36 CFR 219.12 (c)(1)(vii) – Forest Plan</p>	Annual/5 year	Outputs and costs of desired goods and services from annual Tongass report	Forest budget and accounting	Evaluate management practices and change if needed; Forest Plan